

WHAT IS CLAIMED IS:

1. An X-ray detector comprising a photoelectric
converting section of a pixel unit, scintillator pixels
5 containing a fluorescent material I formed on individual
pixels of the photoelectric converting section, and a
partition containing a fluorescent material and/or a
nonfluorescent material disposed between the scintillator
pixels,

10 wherein, when an average particle diameter of the
fluorescent material I is D_s , and an average particle
diameter of the fluorescent material and/or the
nonfluorescent material is D_w , $D_s > D_w$ is satisfied.

2. The X-ray detector according to claim 1, wherein,
15 when a thickness of the scintillator pixels is T_s , an average
particle diameter of the fluorescent material I in the
scintillator pixels is D_s , and a packing density of the
fluorescent material I within the scintillator pixels is F_s ,
 $D_s \geq T_s \cdot F_s / 10$ is satisfied.

20 3. The X-ray detector according to claim 1 or 2,
wherein, when a thickness of the partition is T_w , an
average particle diameter of the fluorescent material and/or
the nonfluorescent material within the partition is D_w , and a
packing density of the fluorescent material and/or the
25 nonfluorescent material within the partition is F_w ,
 $D_w \leq T_w \cdot F_w / 10$ is satisfied.

4. The X-ray detector according to claim 3, wherein
the scintillator pixels containing the fluorescent material I

are formed of a sintered body of the fluorescent material I.

5 5. The X-ray detector according to any of claims 1 to 4, wherein the partition contains a fluorescent material II which has optical characteristics different from those of the fluorescent material I contained in the scintillator pixels and the longest wavelength of fluorescent light equal to or longer than the shortest wavelength of fluorescent light of the fluorescent material I.

10 6. The X-ray detector according to any of claims 1 to 4, wherein the partition contains a fluorescent material III which has optical characteristics different from those of the fluorescent material I contained in the scintillator pixels and the shortest wavelength of fluorescent light equal to or shorter than the longest fluorescence excitation wavelength
15 of the fluorescent material I.

 7. The X-ray detector according to any of claims 1 to 6, wherein the fluorescent material I is a fluorescent material having Gd_2O_2S or CsI as a base material.

20 8. The X-ray detector according to any of claims 1 to 6, wherein the fluorescent material II or III is a fluorescent material having Gd_2O_2S as a base material.

 9. The X-ray detector according to claim 6 or 8, wherein the longest wavelength of fluorescent light of the fluorescent material III is in an ultraviolet region.

25 10. A method for producing the X-ray detector according to any of claims 1 to 9, comprised of forming scintillator pixels on a photoelectric converting section of a pixel unit and forming a partition between the scintillator

pixels, the method comprising:

forming a layer containing a fluorescent material I on the photoelectric converting section of the pixel unit;

forming the scintillator pixel by removing a portion,
5 which is to be the partition, from the layer; and

forming the partition by filling a material containing a fluorescent material II and/or a fluorescent material III.

11. A method for producing the X-ray detector according to any of claims 1 to 9, comprised of forming
10 scintillator pixels on a photoelectric converting section of a pixel unit and forming a partition between the scintillator pixels, the method comprising:

forming a layer containing a fluorescent material II and/or a fluorescent material III on the photoelectric
15 converting section of the pixel unit;

forming the partition by removing a portion other than the portion, which becomes the partition, from the layer; and

forming the scintillator pixels by filling the portion removed in the partition forming step with a material
20 containing the fluorescent material I.

12. A method for producing the X-ray detector according to any of claims 1 to 9, comprised of forming
scintillator pixels on a photoelectric converting section of a pixel unit and forming a partition between the scintillator
25 pixels, the method comprising:

forming a layer of an organic material such as a resin material or an inorganic material such as a metal material on the photoelectric converting section of the pixel unit;

forming a temporary pixel of the resin material or the metal material by removing a portion, which becomes the partition, from the layer;

forming the partition by filling the portion removed in
5 the temporary pixel forming step with a material containing the fluorescent material II and/or the fluorescent material III;

removing the temporary pixel; and

forming the scintillator pixels by filling the portion
10 where the temporary pixel is removed with a material containing the fluorescent material I.

13. A method for producing the X-ray detector according to any of claims 1 to 9, comprised of forming scintillator pixels on a photoelectric converting section of
15 a pixel unit and forming a partition between the scintillator pixels, the method comprising:

forming a layer of an organic material such as a resin material or an inorganic material such as a metal material on the photoelectric converting section of the pixel unit;

20 forming a temporary partition of the resin material or the metal material by removing a portion other than the portion, which becomes the partition, from the layer;

forming the scintillator pixels by filling the portion removed in the temporary partition forming step with a
25 material containing the fluorescent material I;

removing the temporary partition; and

forming the partition by filling the portion where the temporary partition is removed with a material containing a

fluorescent material II and/or a fluorescent material III.